

Lunar halos were also reported from the following stations not included in the districts named above:

Key West, Florida, 29th.  
Terry's Landing, Montana, 26th.  
Helena, Montana, 25th.  
Stockton, Texas, 29th.  
Yuma, Arizona, 7th, 8th, 19th, 20th.  
La Mesilla, New Mexico, 22d.  
El Paso, Texas, 22d, 28th.  
Umatilla, Oregon, 1st, 25th, 27th, 28th, 29th.

### MISCELLANEOUS PHENOMENA.

#### SUNSETS.

The characteristics of the sky as indicative of fair or foul weather for the succeeding twenty-four hours, have been observed at all Signal Service stations. Reports from 187 stations show 5,709 observations to have been made, of which 33 were reported doubtful; of the remainder, 5,676, there were 4,646, or 81.8 per cent., followed by the expected weather.

#### SUN SPOTS.

The following record of observations has been forwarded by Mr. D. P. Todd, Director of the Lawrence Observatory, Amherst, Mass.:

DATE— July, 1882.	No. of new		Disappeared by solar rotation.		Reappeared by solar rotation.		Total No. visible.		REMARKS.
	Gr'ps	Spots	Gr'ps	Spots	Gr'ps	Spots	Gr'ps	Spots	
2, 6 p. m.	0	0	2	10	0	0	5	35†	
3, 2 p. m.	0	5	0	0	0	0	5	40†	
5, 4 p. m.	0	0	0	0	0	0	3	25†	
6, 3 p. m.	0	0	0	10†	0	0	2	12	
7, 3 p. m.	0	0	1	7	0	0	1	5	
9, 6 p. m.	0	0	1	5	0	0	0	0	
10, 3 p. m.	2	15†	0	0	0	0	2	15†	
11, 4 p. m.	0	15†	1	1	0	0	1	30†	Many of the spots small.
12, 3 p. m.	0	0	0	0	0	0	1	25†	Many of the spots small.
13, 3 p. m.	1	5	0	0	1	5	2	30†	Many of the spots small.
14, 3 p. m.	1	15	0	5	0	5	3	40†	Many of the spots small.
15, 3 p. m.	1	10	0	5	0	5	4	45†	Many of the spots small.
17, 3 p. m.	1	15	1	15	1	10	4	35†	Many of the spots small.
19, 3 p. m.	0	0	0	0	0	0	4	35†	
20, 3 p. m.	0	0	0	0	0	0	4	35†	One of spots very large.
22, 3 p. m.	2	10	0	5	2	10	6	40†	
23, 3 p. m.	0	0	0	5	0	0	4	25†	
24, 4 p. m.	0	0	0	0	0	0	3	25†	
26, 2 p. m.	0	0	1	5	0	0	2	20†	
27, 8 a. m.	1	5	0	0	1	5	3	25†	
28, 7 a. m.	0	10	0	5	0	5	3	30†	
29, 11 a. m.	0	0	1	5	0	0	1	15†	
31, 5 p. m.	1	10	0	0	0	0	2	25†	

† Approximated. Faculae were seen at the time of every observation.

Mr. H. D. Gowey, at North Lewisburg, Ohio, reports: Sun-spots were observed on all clear days during the month. They were most numerous on the 1st; largest and most active from the 15th to 18th; and smallest at the close of the month.

Mr. David Trowbridge, at Waterburg, New York, reports: 1st, five groups, eight spots; one new group has appeared by rotation. 2d, two groups, four spots. 3d, four groups, twelve spots; one group has disappeared by rotation. 7th, one group, two spots; faculae in the east. 8th, one group, two spots; faculae in the west. 11th, one group, seven spots. 12th, one group, nine spots, (the same group as the 11th.) 13th, one group, two spots; somewhat cloudy. 14th, three groups, ten spots; one large new group just appeared by rotation. 15th, four groups, thirteen spots; one group has arisen since the morning of the 14th. 16th, four groups, (same as 15th,) eleven spots. 17th, two groups, six spots; a large new group, having five spots and a faint spot in the midst of faculae, is situated near the east margin. Two of the faint groups of the 16th have disappeared. 20th, three groups, eight spots; faculae. 21st, four groups, nine spots; faculae. 22d, four groups, nine spots, (same group as 21st;) faculae. 25th, two groups, six spots; faculae. 26th, two groups, seven spots; all faint; faculae numerous. 27th, three groups, seven spots; one new group appeared by rotation; faculae. 29th, one group, six spots. 30th, one group, five spots, (same as 29th).

The following record of observations has been forwarded by Mr. A. S. Bender, of Sacramento, California:

DATE— July, 1882.	No. of new		Disappeared by rotation		Disappeared by rotation.		Total No. of		REMARKS.
	Gr'ps	Spots	Gr'ps	Spots	Gr'ps	Spots	Gr'ps	Spots	
1, 4 p. m.							5	25*	No. of spots increased.
2, 4 p. m.			1	5*			4	25*	
3, 4 p. m.							3	35*	Much change in appearance of spots.
6, 4 p. m.			1	5*			2	30*	
7, 4 p. m.			1	10			1	15*	Many spots very dim.
8, 4 p. m.			1						
10, 4 p. m.	1	20*					1	20*	
13, 4 p. m.	1	5*					2	25*	
14, 4 p. m.	1	10*					3	35*	
17, 4 p. m.			1	10*			1	30*	
20, 4 p. m.	2	20*					3	25*	
25, 4 p. m.			1	5			2	20*	
30, 4 p. m.							1	45*	
31, 4 p. m.							1	45*	

\* Estimated.

#### METEORS.

New York, 15th: A brilliant meteor was observed at 11:15 p. m., moving horizontally from south to north. It was of a bright bluish color, and left behind it a bright track. The duration of its passage was about twenty seconds.

Goldsboro, North Carolina, 1st: A remarkable meteor was observed in the southern heavens about 10:00 p. m. Its disappearance was succeeded by a noise resembling that of a train in motion, as faintly heard in the distance. The following reports probably indicate that the same meteor was observed at Kinston and New Berne, towns lying southeast of Goldsboro, in this state, and distant about twenty-five and fifty-five miles, respectively:

Kinston, 1st: A terrific meteoric explosion occurred between 8:00 and 9:00 p. m., jarring the windows of the houses and lighting up the streets of the town; duration about one second.

New Berne, 1st: A bright meteor was seen about 9:30 p. m., producing a light brighter than that of the moon. A few minutes after its disappearance, a loud report was heard, resembling somewhat that of a cannon. The course of the meteor was nearly south.

Sandford, Florida, 17th: During the evening a brilliant meteor shot across the heavens from south to north. It passed slowly in a direct line, apparently parallel with the earth, and finally disappeared beneath the horizon. The meteor resembled a ball of fire, at white heat, apparently about six inches in diameter, with a luminous tail about six feet in length, varying from a white flame to a dark brick-red. The duration of its flight was about twenty seconds.

The following report of a meteor, as seen by Captain A. J. McGonnigle, U. S. Army, at Whipple Barracks, Arizona, on the evening of July 9th, has been received:

"When first observed, (about 7:50 p. m.,) the meteor exhibited the appearance of a bright ball of fire, and seemed fully as large as Venus. As it flashed in sight, it fell rapidly, noiselessly and in a perpendicular line, until it reached nearly the verge of the horizon, as bounded by the mountains to the northwest, when it disappeared as suddenly as it appeared, leaving its whole course clearly defined by a straight, bright, glittering line of light. In a few moments, the lower half of this line appeared to drift westward and rapidly assume a serpentine shape, which was plainly discernible for at least ten minutes. Subsequently, and after the serpentine form faded from view, the spot where the meteor was first observed was indicated in the twilight by what appeared to be a small fleecy cloud."

Topeka, Kansas, 5th: At 9:30 p. m., a very brilliant meteor was observed in the western sky. It started from a point near the tail of Leo, and moved toward the horizon. It was apparently about ten-times as large as Jupiter, and was of a yellowish green color.

Fall River, Massachusetts, 28th: At 2:30 a. m., a very bright meteor was observed, which left behind it a bright train, and exploded, lighting up the streets.

Archie, Missouri, 25th: At 8:30 p. m., a very brilliant meteor was observed in the northeastern sky, about 50° above the horizon. Before disappearing it exploded, when two distinct reports were heard.

Murfreesboro, Tennessee, 3d: Between 7:00 and 8:00 p. m., a meteor was observed, apparently of the size of the moon. It was first seen near the zenith; it slowly pursued a southerly course, and exploded before reaching the horizon.

Meteors worthy of less note have been reported as follows:

New Haven, 2d.

Springfield, Massachusetts, 28th, 30th.

Washington, District of Columbia, 31st.

Delaware Breakwater, 30th.

Vicksburg, 10th.

Cleveland, Ohio, 5th.

Davenport, Iowa, 19th, 20th, 22d, 29th.

Wicklow, Dakota, 11th.

Helena, Montana, 13th.

Yuma, Arizona, 3d, 5th, 9th, 10th, 11th, 13th, 14th, 15th, 26th.

Prescott, Arizona, 9th.

Monticello, Iowa, 12th, 13th, 22d.

Fort Madison, Iowa, 25th.

Yates Centre, Kansas, 12th.

Russell, Kansas, 24th.

Fall River, Massachusetts, 12th, 23d.

Protom, Missouri, 9th, 12th, 13th, 14th, 17th, 25th, 26th.

Clear Creek, Nebraska, 15th, 16th.

Murfreesboro, Tennessee, 16th.

#### POLAR BANDS.

Washington, District of Columbia, 31st.

Little Rock, Arkansas, 28th.

Nashville, 3d, 6th, 11th.

New Corydon, Ind., 1st, 2d, 6th, 8th, 10th, 11th, 12th, 15th, 19th, 20th, 29th.

Guttenburg, Iowa, 5th.

Yates Centre, Kansas, 16th, 26th.

Freehold, N. J., 26th.

Wytheville, Virginia, 2d, 21st, 22d, 24th.

#### EARTHQUAKES.

San Francisco, 15th: A sharp shock of earthquake was felt in this city at 7:45 p. m., lasting about seven seconds. The vibration appeared to be from east to west. A very light shock was also felt at 11:08 a. m. of 22d.

Point San José, California, 15th: Slight shock of earthquake felt at this place about 8:00 p. m.

Cairo, Illinois, 20th: An earthquake shock of fifteen seconds duration was felt in this city at 4:00 a. m., which produced a quick rocking motion from southwest to northwest. The shock was sufficient to awaken from sleep, many of the inhabitants.

Cape Mendocino, California, 31st: Light shock of earthquake felt about 12 m. of less than one second duration.

Ironton, Missouri, 28th: A single shock of earthquake was felt at this place on this date.

#### ZODIACAL LIGHT.

Nashville: 3d, 4th, 5th, 9th, 13th, 21st, 23d, 24th, 26th, 27th.

Detroit, Michigan, 18th.

Clay Centre, Kansas, 28th.

Cambridge, Massachusetts: Suspected, 6th.

#### FOREST FIRES.

Sandwich, Massachusetts, 28th: In this vicinity about five miles have been burned over, within which was much valuable woodland. The weather being hot and dry, great difficulty was experienced in fighting the flames. The roots of all shrubs have been burned, and the earth is a complete bed of ashes. During the morning of the 27th a large tract of woodland near Attleborough, was burned over.

East Tawas, Michigan, 27th: Forest fires are raging from Glen Dam to within a mile of Tawas City. Farmers are driv-

ing their cattle to the shore and sending their children to places of safety. On the East Tawas road, three dwellings, much grain, hay and fencing have been burned, entailing great loss. Travel is cut off in many directions. 28th: Fires are still burning to the north, west and south of this place. Fields of grain, farm houses, fences and orchards, together with immense tracts of cedar and pine, are burning. The Hemlock and East Tawas roads are impassable. Brown's Camp, on Hope's creek, has been burned, with a lot of sleighs and lumbering equipage. It is reported that horses, cattle and other stock have been burned, and that farmers are deserting their homes. The fires above Oscodar, have threatened that village.

Less extensive forest fires have been reported from Atco, New Jersey, on the 13th; Bordenton, New Jersey, on the 26th, and at Olympia, Washington territory, on the 11th.

#### MIRAGE.

Indianola, Texas, 19th, 24th, 27th; Swanwick, Illinois, 19th.

#### DROUGHT.

Arkansas: Fort Smith, 25th, cotton and corn are suffering for rain.

Connecticut: New Haven, 31st, reports from all parts of the state show that the drought is very severe. Grass is completely dried up; the hay and berry crops have been much injured. New London, 31st, the month has been very dry and crops have suffered greatly. The oat crop proved a total failure, and was mostly cut to be used as hay.

Illinois: Champaign, 25th, very dry and dusty; rain much needed. 31st, copious rain; drought ended. Springfield, 26th, corn suffering for rain. Charleston, 30th, corn suffering from drought.

Maine: Gardiner, at the close of the month, rain is much needed.

Maryland: Fallston, 29th, before the rain of this date, gardens and the corn crop were suffering from drought. The potato crop will probably be materially shortened in this section.

Massachusetts: Westborough, 31st, month very hot and dry. Brooks and springs are drying up; and are lower than they have been known for many years. Somerset, severe drought during the latter part of the month.

Montana: Fort Missoula, 17th, weather excessively hot and dry; the grass on the adjacent hillsides and surrounding prairie is completely burned up. The drought continued until the rain of the 23d.

New Hampshire: New Market, 31st, month very dry; no rain has fallen since the 20th, and only a few light showers fell during the earlier part of the month. Crops are suffering for rain; on highlands grass is burnt to the ground. The drought is the severest that has been experienced in this section for many years. Contoocookville, 31st, month very hot and dry; vegetation in light soil is suffering severely for rain. Grafton, 31st, severe drought, corn, potatoes, wheat etc., suffering for rain.

New Jersey: Cape May, 31st, the crops in this section have been damaged by the continued drought. Vineland, 31st, month has been very hot and dry; the berry crops have suffered from drought; potatoes have been injured to some extent. Freehold, 26th, crops are suffering much from drought.

New York: Ardenia, at the close of the month, the weather is very dry; crops are suffering for rain, and streams are very low. Palermo, 24th, month very dry; vegetation suffering from drought.

Ohio: Westerville, 26th, the ground is becoming very dry; rain is much needed.

Oregon: Portland, 12th, the wheat crop is very poor, being due to drought. Farmers are mowing and stacking it to be used as hay. Portland, 20th, weather very dry, rain is much needed.

Pennsylvania: Fallsington, 31st, corn is suffering for rain; the ground is very dry and hard.

*Vermont:* Woodstock, 31st, during the last half of the month, the weather was very warm and dry; vegetation is suffering much from drought.

#### INSECTS.

Point Judith, Rhode Island, 19th: Army worms appearing in small numbers.

Portland, Maine, 26th: Army worms are reported to be injuring crops in the surrounding country.

Bangor, Maine, 24th: The army worm is reported as doing considerable damage to crops.

Newport, Rhode Island, 21st: Army worms are reported to be very numerous, and are doing much damage to crops in neighboring localities.

New London, Connecticut, 31st: The army worm made its appearance about the 10th, and proved very destructive to grass and crops for ten or twelve days; very few were seen after the 29th.

New York, 15th; Army worms are doing great damage to oats, barley, corn and grass in Suffolk county, and along the Connecticut coast.

Fort Missoula, Montana, 17th: Grasshoppers are appearing in great numbers.

Charleston, Illinois, 6th: The army worm has done considerable damage to meadows. 30th: Chinch bug is doing much damage to corn.

Vevay, Indiana, 2d: Insects are proving destructive to vines and flowers.

Creswell, Kansas, 9th: Large numbers of chinch bugs are appearing in this locality.

Fall River, Massachusetts, 16th: Army worms are reported to have appeared in great numbers on farms in this vicinity. They have also made their appearance in this city, on lawns and other grassy places. On the 25th, corn and oats are being destroyed by army worms.

Somerset, Massachusetts, 18th: Army worms have appeared in large numbers, and have destroyed many acres of grain.

#### WATER-SPOUTS.

Cleveland, Ohio, 4th: During the afternoon, heavy, sullen clouds were observed on the northeastern horizon. At about 6.00 p. m., they were driven by a northeast wind toward the city. When about one mile distant, over the lake, a revolving motion was noticed near the edge of the cloud, and a cone was gradually formed, which descended to the surface of the lake, forming a perfect water-spout. Two other water-spouts were afterwards observed in the vicinity of Rocky river, five miles west of the city. All disappeared when they approached the shore.

#### SAND STORMS.

Coleman City, Texas, 12th.  
Fort Cummings, New Mexico, 10th.  
Camp Thomas, Arizona, 3d, 6th, 8th, 13th, 15th, 17th, 18th, 30th.  
Lewiston, Idaho, 9th, 13th, 24th.  
Umatilla, Oregon, 4th, 23d.  
Fort Union, New Mexico, 2d, 15th.

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